Building Impact

Developing Superior Processes

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Capstone Project

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You are not here merely to make a living. You are here in order to enable the world to live more amply, with greater vision, with a finer spirit of hope and achievement. You are here to enrich the world, and you impoverish yourself if you forget the errand.

-Woodrow Wilson

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1 Executive Summary

Building Impact (BI) is a non-profit organization located in Boston, MA whose mission is to create volunteer opportunities for individuals and companies in the community by connecting local buildings and companies to the needs of non-profits. They offer six types of events, which have different processes and sub-processes: Donation Drives, Blood Drives, Community Events, In-Office Events, Corporate Events, and One-Off Donations. Building Impact has not documented these processes formally; the purpose of this project is to learn how their processes are structured, create process models, and use those models to identify areas for improvement.

Due to the lack of available data and the need for process documentation, a qualitative approach has been taken in the analysis rather than a quantitative approach. Potential modeling software to create the process models was evaluated to determine the best fit for BI's needs. The process models were then created by reviewing the documentation provided by BI, which included best-case scenarios and sub-steps, and inputting them into the software.

Assessing the worst-case scenarios facilitated identification of potential improvement areas. The recommendations were developed based on the models of current processes and the improvement areas that were discovered in the worst-case scenarios. The recommendations cover several areas, including general recommendations for their processes, ways to integrate their current business tools, website changes and automation, and event-specific recommendations. The major process changes result from improvements to their website using automation and the creation of website portals for BI's Program Partners.

BI will be able to incorporate some of the suggestions without assistance, but implementing some of the recommendations will require outside technological expertise. After the technological improvements have been implemented, BI should start a data collection process that can be used for a future modeling and simulation project to help identify how to best utilize their resources with the new and improved processes. Our recommendations and rollout plan will help BI more efficiently utilize their existing resources to help address the growing need for donations and volunteerism in the community.

2 Introduction

Our project was to work with Building Impact to improve their processes in a way that more efficiently utilizes their resources to work with their Corporate and Non-Profit Partners. This chapter introduces Building Impact, the need for our assistance, the problem statement, and the scope for our project.

2.1 Background

Building Impact (BI) was founded in Boston, MA in 2003 to serve as an intermediary between building management and non-profit charities. Building Impact connects buildings' resources (donations and volunteers) to the needs of non-profits in the community. BI serves 53 buildings with 575 companies and over 20,000 employees, along with over 40 members in the Non-Profit Partner (NPP) network.

Building Impact currently has seven full-time staff members, including a Chief Executive Officer, Program Director, Communications & Operations Director, Marketing Director, Program Coordinator, and two Community Connectors (CCs). Their CEO joined the organization in September 2011, and is eager to bring new ideas to the organization. The BI website provides limited capability to allow volunteers to find and sign up for certain events. This website also provides information on how non-profits, buildings, companies, and volunteers can communicate with BI, via e-mail or phone.

BI provides the following services:

2.1.1 Donation Drives in Buildings

Every other month, BI hosts Donation Drives to benefit a Non-Profit Partner. These usually take place in lobbies and require flyers to be posted throughout the building and boxes to be put out for collection. These drives collect items that usually relate to the season and have included canned food, winter coats, books, and school supplies. BI staff members retrieve, count, and deliver the donations to the Non-Profit Partners personally.

2.1.2 Blood Drives

BI helps support local hospital Blood Drives by using their network of buildings to provide space for these events. They also help promote and advertise for the event, coordinate donor appointments, and provide at least one staff member to support Blood Drive event needs. Larger hospitals have bloodmobiles and do not require the service of providing space that BI makes available. However, these hospitals do get BI support through event promotion and assistance from a staff member. Drives without bloodmobiles require coordinating the use of office space.

2.1.3 Community Events

BI organizes about three to four one-time Community Events per month in the Boston area during evenings and weekends. BI recruits volunteers by advertising the events through signs in buildings, newsletter e-mails to individuals on the mailing list, and postings on the BI website. These events can include river and park cleanups, helping to feed the homeless, sorting donations for needy families, and assisting with charity fundraising events.

2.1.4 In-Office Volunteer Events

BI offers volunteer activities that companies host in their own space during working hours. Companies want their staff to participate in a volunteer event during their working hours to help contribute to the community, and request that BI help to organize the event. Companies often have specific numbers of employees available, restricted hours to perform the work, and a desired issue area they would like their work to contribute towards. BI will also try to match non-profit requests for this type of assistance with companies that are available for such events. BI staff plans, coordinates, and leads these events on a case-by-case basis in conjunction with representatives, called *Ambassadors*, from the companies. BI then delivers the outputs of the event to the benefiting NPP.

2.1.5 Corporate Volunteer Days

BI organizes volunteer activities for companies based on their interests to support a local Non-Profit Partner. Companies will inform BI of their weekday volunteer availability, and BI will match that to a non-profit need. Often, companies have restrictions relating to season, time of day, day of the week, location, issue area, transportation, and other factors that limit the possible types of events that NPPs can accommodate. Companies' restrictions on event type necessitate BI's role in matching their desire to volunteer and donate with the realistic requirements of NPPs. BI staff members then lead the event with corporate groups.

2.1.6 One-Off Donations

Building management and companies donate supplies and money, with BI facilitating a match for the supplies, often on short notice. BI will contact its NPP network, or reach out to other organizations to match the donations. These donations can typically arise when a company moves or goes out of business, leaving the building management to empty the offices quickly for cleanup. In many cases, BI has a very tight timeframe to find an organization to accept, and often pick up, the donations.

2.2 Needs

Building Impact provides one or more of its seven staff members at all events in order to ensure each event runs smoothly. BI believes that a good experience for volunteers will increase the chances of individuals and companies volunteering again, so their deep involvement with every event and partner is an important aspect of the products that they offer to clients. To get to these events, BI utilizes Zipcar

rentals on an hourly basis. They also use Zipcar to retrieve and deliver contributions from Donation Drives.

Building Impact stays in constant contact with Corporate and Non-Profit Partners. Matching corporate availability with non-profit needs, they spend a significant amount of time filling gaps when the two do not match perfectly, which is often the case. BI informs building employees about Donation Drives and volunteer events via e-mail and posters. Corporate partners try to plan their events up to a year in advance, but non-profits typically do not know their needs until six months in advance, at most. High turnover rates of volunteer coordinators at non-profit partners make strong communication, relationship-building, and networking difficult, although this is still an essential aspect of Building Impact's work.

Building Impact currently plans all events via Microsoft Outlook e-mails and Outlook calendars, with information being stored in Excel and *Salesforce*. Microsoft Project is a tool that has not yet been utilized by BI. *VerticalResponse* had been used previously, but high bounce-back rates forced staff to use it just to create e-mail content and use Outlook for actual distribution of e-mails.

The event planning process is not done in a systematic way, but rather through experience, memory, and Outlook calendar tools. Although BI has seen significant growth in its partnerships over the last two years, this is a critical area that is not currently performed in a systematic and formally documented way.

Building Impact is currently piloting the organization of a Day of Service event for Dassault Systèmes. This is a one-weekday event during which 800 employees will be volunteering at 15 community volunteer events and six In-Office Events. BI is also piloting an expansion to Connecticut with an In-Office Event and a Donation Drive, both of which require a staff member's presence. However, they are trying to determine if they would need to be present at all events in Connecticut.

BI needs to utilize their resources more efficiently, which they can accomplish through systematizing and streamlining their event planning and execution processes. BI needs formal documentation with detailed descriptions of their events and models of the processes. Once the processes are documented and conducted in the most efficient manner, volunteers and staff members will have a greater impact in expanding the reach of the organization. This process will save time in training volunteers and staff, utilizing BI's resources more efficiently. Through the use of these models and detailed event processes, the improvements in operations will allow for more effective use of their current assets and maximize the impact of future expansion.

2.3 Problem Statement

In 2011, Building Impact's 349 different service opportunities generated over $600,000 in value for the community through volunteerism and donations, which represents a 100% increase from 2003. Since

2004, the number of individuals in the companies BI works with has increased from about 4,000 to over 20,000. The need for donations and volunteerism has increased greatly over the last several years, and there is enormous opportunity for BI to grow and expand its reach. With few staff members and no formalized event processes, it has become essential for the organization to become more efficient in its use of limited resources to continue this growth.

Building Impact requested that the George Mason University Consulting Team review who its clients are and what its products are. BI wants to have a clear vision on how to focus its resources going forward to improve its products and provide the best services to its clients. BI specifically asked for assistance regarding streamlining communications, execution of events, and coordinating event planning.

2.4 Scope

Building Impact requested that we review who its clients are and what its products are, so we chose to review all of their event types and the processes associated with them to help BI develop a deeper understanding of how their organization currently operates. This will assist them with their understanding of their own corporate structure and needs. Reviewing how BI's organization is structured is out of the scope of this project; however, we address in Section 6: Way Ahead how they can move forward on this issue.

The scope of this project involved developing a process flow diagram to document in detail each of the events Building Impact organizes, from inception to completion. We used the diagrams as a tool to analyze their processes to improve efficiency in the following areas:

2.4.1 Communication

1. Contact with corporate clients
2. Contact with non-profits
3. Creation and dissemination of advertising material
4. Website capabilities
5. Technology tools (*VerticalResponse*, *Salesforce*, MS Outlook)

2.4.2 Events

1. Document the processes of planning and executing events
2. Streamline the processes of planning and executing events
3. Assess possible modeling software available to meet BI's needs
4. Create Business Process Modeling Notation (BPMN) flowcharts for each event

2.4.3 Logistics

1. Find potential improvements in coordination of events

2. Determine resource utilization improvement areas

2.4.4 Organization

1. Find improvements in planning and tracking of events
2. Coordinate event planning and execution among staff
3. Improve feedback process for events (for non-profits, companies, and volunteers)

To create process flow diagrams, we had to determine the best software tool for our purposes. This is described in the following sections.

3 Software Decision Analysis

This chapter introduces our qualitative analysis to determine what modeling language to use for our analysis, what objectives we have for evaluating potential software, and how we determined what software to use to design the models (using decision analysis).

3.1 BPMN or UML

We had to decide which type of modeling practice to focus on when attempting to choose a software package for BI. The two most applicable modeling languages are BPMN (Business Process Modeling Notation) and UML (Unified Modeling Language). Both BPMN and UML are modeling languages that can create flowchart-like models to represent the flow of execution of a process. UML uses activity diagrams to design models that are generally at a component level. BPMN uses flowchart options designed to build models that describe business processes.

BPMN is designed for an overview and most importantly, it is an event-driven choice modeler. That means it focuses on actual events that take place, like a response to an e-mail or an approval of an application. Because these are the types of events that BI handles in the workplace every day, BPMN is the most applicable modeling language for BI's processes. It will allow BI to relate to and understand the models more easily, as well as increase the potential for use after the project's completion.

While BPMN is event-driven, UML typically focuses more heavily on signals to drive choices, like that of electrical systems; this means its functionality is directed at a lower level than what BI has use for. UML is made to handle modeling requirements and details for software and IT-related agendas. Although it is feasible to use UML to model business practices and processes, the benefits of using a BPMN software package are greater than the benefits of UML. We discussed the benefits of the different modeling software options with BI and came to the decision that BPMN is better suited to their needs.

We also worked under the assumption that BI will continue to use this software after the completion of this project. In our opinion, BPMN can be learned more easily and has many valuable tutorial websites and support available. UML is focused and used more for software engineering, and thus its available tutorials are generally not as clear to those without a background in engineering or computer science.

There have been studies to provide users with the core values and differences of BPMN and UML.[1] BPMN came into existence with the goal of being more readable, specifically for non-engineering business-focused users. Several papers suggest that BPMN is more readable when given models using BPMN and UML to college freshman of varying backgrounds. The improvement in readability was

[1] http://homepages.dcc.ufmg.br/~cascini/SBQS_2008.pdf, http://www.soberit.hut.fi/T-86/T-86.5161/2006/BPMN_vs_UML_final.pdf

discovered to be minimal and final determination between the two should be made more on personal preference and needs than on functional use. For the reasons described above, BPMN was selected as our modeling language of choice.

3.2 Objectives Hierarchy Network

In order to help determine which categories should be used to evaluate potential modeling software tools, we created an objectives hierarchy network. This involves two different types of objectives: fundamental and means. The fundamental objective is similar to describing the final goals of the customer for what is wanted from the modeling software. They can also be looked at as the "Why this is important" answer when connected to means objectives. The means objectives are more in reference to "How these goals can become accomplished."

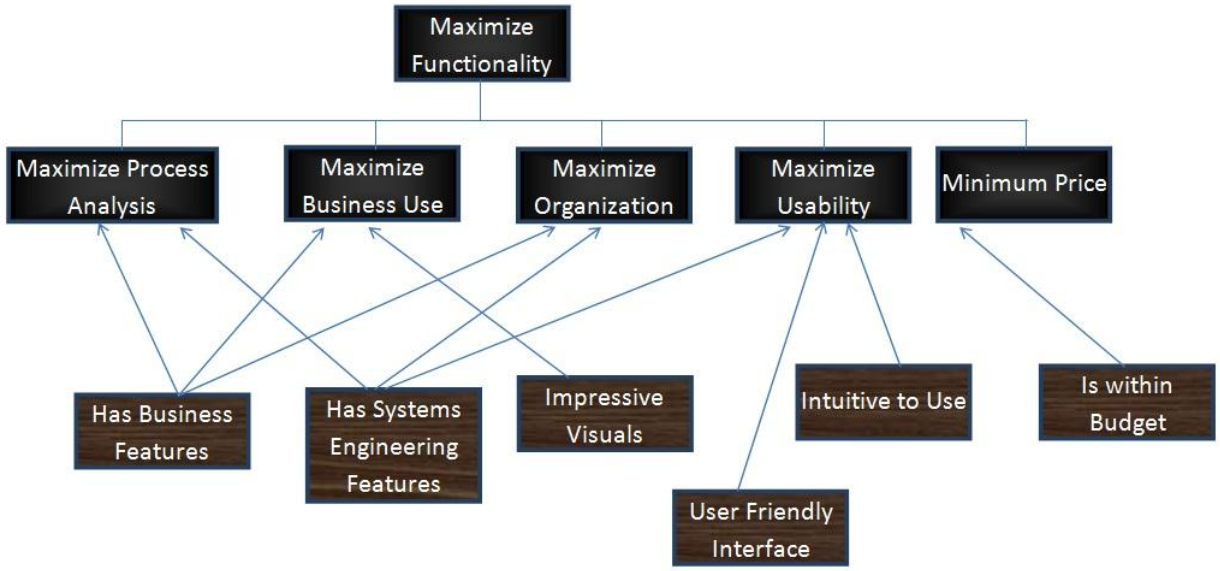

Figure 1: The Objectives Hierarchy Network

We developed an initial version of the objectives hierarchy network and presented it to Building Impact. This hierarchy was explained, as it was a new concept for them. They understood the idea behind it and worked with us to finalize it. The absolute goal of the software is to be able to provide us with the ability to model throughout the semester, be user-friendly enough for future Building Impact use (after project completion), and provide a means to evaluate Building Impact's current processes. Given the network presented in Figure 1, we rated the modeling software packages on the following five attributes that would best fit our objectives hierarchy network:

1. Price
2. Usability
3. Quality

4. Features
5. Visual Impact

3.3 Modeling Software Evaluation

3.3.1 Method of Swing Weights

There were initially five BPMN modeling software packages that we analyzed for Building Impact's needs. Among the five, two were eliminated due to cost and functionality factors that made them unsuitable for BI's needs. There were three that established themselves as superior to the rest: *ProcessMaker*, *AccuProcess*, and *Bizagi*. The sums of our scores for each attribute for these three packages are seen in Table 1 below. For our final decision analysis, we only considered these three BPMN software packages.

	Price	Usability	Quality	Features	Visual Impact
Weights	*25%*	*35%*	*15%*	*20%*	*5%*
ProcessMaker	$1,250	10	12	12	8
AccuProcess	$1,000	12.5	10	12	10.5
Bizagi Process Modeler	$0	13	13.5	10.5	14.5
Worst Score	$1,250	10	10	10.5	8
Best Score	$0	13	13.5	12	14.5

Table 1: Modeling Software Evaluation

For each software modeling package, we determined judgmental scores for four out of five attributes (Usability, Quality, Features, and Visual Impact). We did not score Price because this was a non-judgmental attribute naturally quantified. The scores are a summation of all our team members' individual judgments, each scored between 0 and 5, for each attribute (seen in Table 1). The best and worst scores are also included in Table 1; these will be used later in our analysis. Once scores were determined, a weight for each category was determined. Initially, Building Impact took the categories and discussed them in an internal group meeting to establish appropriate weights for each category according to the organization's values. Their decisions provided us the weights as seen in Table 2.

We originally intended to use swing weighting to help Building Impact find the proper weights for the attributes, but because they had already provided us with these weights, we had to use a modified version of swing weighting. Before explaining the modified approach ultimately used for this project, the traditional method of swing weighting will be explained, followed by an explanation of our modification.

Swing weighting is used to determine weights for each attribute based on the best and worst scores of those attributes for the software choices being analyzed. The first step in swing weighting is to

determine the attributes being used, which we obtained through the objectives hierarchy network as previously explained. The next step is for the decision maker to rank those attributes in order from most to least important. The third step is to obtain the best and worst values for each attribute so that the spread of the differences can be observed. For example, the best value for Price is $0 and the worst value is $1,250. The same premise follows for the remaining attributes. The best and worst values are marked in the above Table 1; the green highlighting represents the best values and the red highlighting represents the worst values.

The last step before calculating the weights is to have the decision maker decide how important each attribute is (on a scale from 0 to 1) based on the previously determined rankings and range in scores – we call this result Importance. The highest-ranked swing for an attribute is the most important and is automatically given a value of 1 for Importance. Then the decision maker looks at the second highest-ranked attribute and compares its difference between the best and worst scores with the highest-ranked attribute's difference between the best and worst scores. The decision maker subjectively chooses the Importance value by this comparison; the Importance for the second highest-ranked attribute represents the percentage of the Importance of the highest-ranked attribute that the second highest-ranked attribute is worth. Since this is a complicated subject to explain (as you can tell), we will provide an example.

For example, in Table 2 below, Usability is the highest-ranked attribute and Price is the second highest-ranked attribute. The Importance of having the software being free compared to costing $1,250 (Best-Worst for Price) is 71% as important as 3 additional points for Usability (Best-Worst for Usability). The procedure is performed again for each attribute to compare the swings between best and worst values against the highest ranked attribute.

	Price	Usability	Quality	Features	Visual Impact	Sum
Rank	2	1	4	3	5	
Best Score	$0	13	13.5	12	14.5	
Worst Score	$1,250	10	10	10.5	8	
Importance	0.71	1.00	0.43	0.57	0.14	2.85
Weight (K)	25%	35%	15%	20%	5%	100%

Table 2: Swing Weighting Evaluation

Now that the Importance values have been declared by the decision maker, the weights can be obtained. In order to calculate the weights, first the sum of the Importance values is computed. Second, the weight of the attribute, $K_{<attribute>}$, is evaluated by the following calculations:

$$K_{Usability} = {}^{1.00}/_{2.85} = 0.35$$

$$K_{Price} = {}^{0.71}/_{2.85} = 0.25$$

$$K_{Features} = {}^{0.57}/_{2.85} = 0.20$$

$$K_{Quality} = {}^{0.43}/_{2.85} = 0.15$$

$$K_{Visual\ Impact} = {}^{0.14}/_{2.85} = 0.05$$

Since Building Impact generated their own attribute weights prior to our analysis, we performed a modified swing weighting. We already had the weights for each attribute, so we ranked the categories in descending order by their weights; ranking the highest value as best ranked and so forth. The next step was to reverse engineer the weights to find the Importance values. Using the formulas above, we calculated the Importance values based on the weights provided by BI for each attribute.

$$K_{Usability} = {}^{1.00}/_{x} = 0.35 \Rightarrow x = 2.85$$

$$K_{Price} = {}^{y_1}/_{2.85} = 0.25 \Rightarrow y_1 = 0.71$$

$$K_{Features} = {}^{y_2}/_{2.85} = 0.20 \Rightarrow y_2 = 0.57$$

$$K_{Quality} = {}^{y_3}/_{2.85} = 0.15 \Rightarrow y_3 = 0.43$$

$$K_{Visual\ Impact} = {}^{y_4}/_{2.85} = 0.05 \Rightarrow y_4 = 0.14$$

The Importance row in Table 2 shows the results of this effort. Once these were established we presented this information to Building Impact so that they would understand exactly what their weights stated about the attributes. With a clear understanding of the swing weighting concept, they agreed with the Importance values.

3.3.2 Multi-Attribute Utility Analysis

In order to be able to compare the scores across all attributes by modeling software, we need the scores to be on the same scale for an appropriate comparison. Price used a different scale than the other attributes so we normalized Price using the formula (Low-Value)/(Low-High) and we normalized the other attributes using the formula (High-Value)/(High-Low). The first equation was used for Price because a lower value is favored over higher values, which this equation takes into account. The final scores resulting from the normalizing equations can be seen in Table 3 below.

	Price	Usability	Quality	Features	Visual Impact	Matches BI Needs
BI Weights	25%	35%	15%	20%	5%	100%
ProcessMaker	0.00	0.00	0.57	1.00	0.00	29%
AccuProcess	0.20	0.83	0.00	1.00	0.38	56%
Bizagi Process Modeler	1.00	1.00	1.00	0.00	1.00	**80%**

Table 3: Normalized Scores

After the normalized values were obtained, all values were multiplied by their attribute weights and summed for each software package. For example, AccuProcess has 0.20 for Price, 0.83 for Usability, 0.00 for Quality, 1.00 for Features, and 0.38 for Visual Impact. This results in the following equation to determine the final score for AccuProcess:

$$(0.20 \times 0.25) + (0.83 \times 0.35) + (0.00 \times 0.15) + (1.00 \times 0.20) + (0.38 \times 0.05) = 0.56$$

This is how the final score of 56% was obtained for AccuProcess. The same method was used for ProcessMaker and Bizagi Process Modeler. After all calculations were performed, Bizagi Process Modeler was determined to be the best software to use for Building Impact with a score of 80%.

3.3.3 About *Bizagi*

Bizagi is an English company specializing in business process management. We used Bizagi Process Modeler, a free download from their website[2], to create business process models of each of Building Impact's six types of events. This software is designed for process diagramming and process documentation using standard BPM notation. An updated version was released mid-way through our project, so we were unable to fully explore additional functionality. While Bizagi Process Modeler is designed to model processes, Bizagi BPM Suite has functionality to automate the process and turn the models into simulations. *Bizagi* offers a free evaluation copy of their BPM Suite, but we chose not to work with this. For our project, understanding and modeling the various events was a complex task in itself, and we felt that preparing for a more formal and quantitative simulation model in the future would be more beneficial to BI.

[2] http://www.bizagi.com/

4 Technical Approach

Initially a software package had to be selected for the continuation of the project. Preliminary steps were taken to allow for a stronger analysis of the modeling software used to represent BI's processes. The method of swing weights and multi-attribute utility analysis were used to determine the most appropriate software. Once the modeling software was selected, we collected best-case scenarios for the events, as well as the sub-steps for broader tasks. BI also supplied worst-case scenarios to further highlight gaps and inefficiencies. Models were created using the best-case and sub-step scenarios, which were then analyzed to create recommendations for BI.

4.1 Building Impact Processes

We created *Bizagi* models of the current processes for all six types of events that BI offers. These models include sub-steps. In this section, we examine In-Office Events' best-case scenarios and sub-processes to show how we developed our recommendations. Qualitatively reviewing the *Bizagi* models allowed us to examine the event processes in detail to identify areas for improvements. We did not model worst-case scenarios, as we were able to develop additional recommendations directly from the information provided – models for these scenarios would not be valuable to Building Impact nor this project. Best-case scenario models and sub-step models for all other event types are provided in Appendix E: BPMN Models.

4.1.1 Best-Case

This section describes our *Bizagi* model for BI's In-Office Events. See Appendix E: BPMN Models for details of the rest of the event models. All event models follow a similar pattern – they are each separated into the following three sections:

- Pre-Event – models the planning and customer communication steps that are necessary to organize an event
- Event – generally contains an "Execute" sub-process and contain any other steps that occur while the event takes place
- Post-Event – models the necessary steps required once the event has completed, including gathering feedback from all parties involved in the event

4.1.1.1 Pre-Event

Before any steps begin in this diagram, BI and a Non-Profit Partner set up an In-Office Event with a goal and date. About one month prior to the originally planned start date, BI contacts the NPP to confirm that this event is still wanted by the NPP. Once the confirmation is received, the event is posted in BI's monthly mailings and all necessary event signs are updated. Once the signs are complete, the Program Coordinator will create an event posting on the BI website for the event. After the website creation, a monthly e-mail is sent to all Program Partners. BI should receive e-mails and phone calls expressing interest from different offices, but if there are no responses, then there will be no In-Office Event if BI cannot find a sponsor. If there are responses, then the events are first-come, first-served due to limited supplies or BI staff time. If the event has reached the cap for offices volunteered, then BI will have to inform any additional requesting offices that the volunteer event is full. Set-up for the event can then begin – this is a sub-process described in Appendix E: BPMN Models.

We reviewed this model and observed that matching non-profit requests for In-Office Events consisted of a time-consuming matching process. As seen in Section 5.3.3, we recommend automating this step. We also noticed that informing Corporate Partners that the In-Office Event capacity has already been reached is a procedure that can be automated for BI; alternatively, this step can be removed by utilizing online sign-ups, also described in Section 5.3.3. The sections of the model from which we derived these recommendations are highlighted in the red boxes in Figure 2 below. The updated model with the recommendations implemented and described is in Section 4.1.4: Improved Process.

[SENSITIVE INFORMATION REDACTED]

Figure 2: In-Office Event – Pre-Event *Bizagi* Model

4.1.1.2 Event and Post-Event

In the Event section there is a sub-process indicating that the event is being executed. In the Post-Event section there is a sub-process denoting that there is post-event work to be accomplished. Then the products of the In-Office Event will be dropped-off at the NPP the event was for. Lastly, feedback from all parties involved will be solicited.

[SENSITIVE INFORMATION REDACTED]

Figure 3: In-Office Event – Event and Post-Event *Bizagi* Model

4.1.2 Sub-Processes

The In-Office Event has several sub-processes, all of which are included in Appendix E: BPMN Models. We will only describe the Solicit Feedback sub-process, as this is where we noted some potential updates to the process.

Once the event is completed and all donations are dropped off, feedback is garnered from the NPP and volunteers. The NPP feedback is obtained from surveys sent via *VerticalResponse*. Some volunteers

receive paper surveys and some receive *VerticalResponse* questionnaires; paper surveys are manually inputted into *VerticalResponse*. The Community Connector who facilitated the event enters information into *Salesforce* regarding who participated and internal ratings on how well the event went.

[SENSITIVE INFORMATION REDACTED]

Figure 4: In-Office Event – Solicit Feedback *Bizagi* Model

The highlighted boxes in Figure 4 above show the areas in which we found room for improvement. As explained in Section 5.1.4: Feedback, we recommend that BI automate surveys to be sent to NPPs and volunteers. Software we recommend will allow BI to automatically integrate the *VerticalResponse* survey results with *Salesforce*, meaning this entire sub-process would be automated without BI interaction.

4.1.3 Worst-Case

The table below shows the worst-case scenarios summarized for In-Office Events. We used these scenarios, in addition to the models we created, to develop recommendations to help avoid them in the future.

[SENSITIVE INFORMATION REDACTED]

Table 4: In-Office Event – Worst-Case Scenarios

By reviewing the Pre-Event worst-case scenarios, we observed that many of the errors occur from timing issues with publishing the event to the annual calendar – our recommendation of a quarterly calendar, as well as offering the calendar to all Corporate Partners, will remedy most of these problems. Having no activity for a Corporate Partner to volunteer for, when they have already reserved the time slots months in advance, is a major problem, and should occur with less frequency with our recommendation that they share all events with Corporate and Non-Profit Partners through a web portal. These recommendations are described in more detail in Chapter 5: Recommendations.

The worst-case scenarios for the Event itself led us to recommending a task management software to create checklists and deadlines for BI staff to avoid many of these recurring problems. We also reviewed the Post-Event worst-case scenarios and developed recommendations to automate the feedback from all customers. These recommendations are also described in more detail in Chapter 5: Recommendations.

4.1.4 Improved Process

The model below is the Pre-Event portion of the updated In-Office Event. This model shows the value of implementing the web-based recommendations we describe in Section 5.3: Website Changes. Almost all improvements will be found in the Pre-Event section. Implementing web-based options for the Program Partner will remove time-consuming communication between BI and the Program Partner.

[SENSITIVE INFORMATION REDACTED]

Figure 5: In-Office Event – Improved Process *Bizagi* Model

The first change that occurs is that the monthly e-mail and signs are not the only updates needed in that step. Now BI will create a website for the Program Partner web portal to display the event and a way to sign up for it. A link to this event page will be included in the monthly e-mail. With the updates, more work is being done by the Program Partner and it is being completed more easily. Instead of the Corporate Partner Ambassador creating an e-mail to send to BI, they instead follow the link and click a button to submit interest. An automated e-mail is then sent to BI with the name of the person, the office he/she belongs too, the number of volunteers for each office, and the total number of offices signed up. BI will no longer have to respond to e-mails requesting additional information or informing potential sponsors that an event has reached capacity – the web portal will now be able to automate these tasks.

4.2 Flowchart Analysis

Business Process Modeling is a formal way of documenting how current processes are laid out. This allows users to visualize the processes and identify inefficiencies or areas for improvement in steps. *Bizagi* is an appropriate tool for our purposes since it is an open-source software that has available online support tutorials and forums, which were important features to meet BI's needs for software tools. The goal of documenting the current processes in a formal manner is accomplished, and BI staff or future project groups can take the models we developed and alter, expand, or consolidate them as necessary. We did not feel we would be able to automate the models or turn them into running applications given the time constraints of this project, so we did not pursue running the models in *Bizagi* BPM Suite.

The process of viewing any given task in the completed process models with regards to other tasks, various BI staff, Program Partners, and Non-Profit Partners is a valuable lesson in understanding how Building Impact currently operates, as well as how to find inefficiencies. The best-case scenarios and sub-steps gave us a clearer insight into BI's processes, which enabled us to create the *Bizagi* process models. The worst-case scenarios were critical in helping to identify process gaps and inefficiencies. Qualitatively analyzing the process models in conjunction with the worst-case scenarios, we were able to develop recommendations to streamline their processes and improve efficiency. These recommendations are explored in Chapter 5, and the models are in Appendix E: BPMN Models.

4.3 SRS

We created a System Requirements Specification (SRS) document, that is not is not included in this report, to aid Building Impact in their future website development needs. Many of the suggestions we have for Building Impact are related to enhancing the feature set of their website, which has become a work in progress during the course of our time working with them.

The SRS encompasses what needs to be accomplished for BI's website in order for BI to be able to follow all of the suggestions we have offered. It provides a general introduction of BI and the reason for the requirements listed within it. BI is in need of additional features for their website; these cannot be accomplished without outside assistance, either from volunteers or paid contractors. The SRS supplies any party that BI recruits to work on the website with a detailed list of requirements to follow and generate additional ideas from.

The SRS is an organized structure of the improvements being suggested that can be implemented through the BI website. BI currently has a single volunteer updating the website during her free time. We also suggested several websites for hiring web development services that are known to be used by other nonprofit organizations. If BI chooses to use a paid web developer that requires a contract or if BI continues to find volunteers, this SRS can be used to express exactly what requirements are expected in the restructured Building Impact website. By supplying BI with an SRS product, BI will be able to coherently and professionally express what needs and functionality the contractor should implement.

5 Recommendations

As a result of developing process models for each of BI's event types and analyzing them with the most commonly encountered problems as depicted by the worst-case scenarios, we have produced several recommendations that will improve their use of resources and streamline their processes. In this chapter we discuss our general recommendations, recommendations for using their current business tools, website improvement recommendations, and recommendations for each event type.

5.1 General Recommendations

Our general recommendations are applicable to multiple event types or different stages in the event planning process. We recommend enforcing a standardized policy with regard to their communication wait times, incorporating checklist software and calendar solutions to improve task management, preparing backup activities for appropriate events, and eliciting feedback via web-based surveys.

5.1.1 Communication Standardization

BI's current processes do not contain enforced standardized practices for their Corporate and Non-Profit Partners in regards to communication response wait time. This can include no response from NPPs to BI's inquiries when matching corporate availability to non-profit needs, or not receiving feedback after coordinating an event. This creates gaps and increases scheduling variability in BI's processes, since they must wait for their clients to respond to requests. This can consequently result in a cascade of delays that can impact how the event is executed or even whether the event can occur.

We recommend that BI implement a standardized wait time for responses, which they should communicate to their NPP and Program Partners. It can be set up as a recurring task in Microsoft Outlook for the Program Coordinator to be used for both Corporate Events matching and non-profit feedback. This will assist BI's Program Coordinator, as it will prevent processes from being delayed due to communication issues. BI should emphasize that they cannot guarantee a match if their standardized deadlines are not met. These deadlines may have to be variable and somewhat flexible depending on particular situations; however, communicating the need for a structured business policy in this area will change the current practice of ad hoc response time, thus increasing efficiency during the event planning and feedback stages.

5.1.2 Task Management

Many of the challenges that BI encounters are a direct consequence of lacking procedural documentation for guidance in event planning and execution. Their processes have numerous components and are very detailed, which can produce errors and lead to tasks being overlooked because the staff does not have documented references to follow.

In order to address these issues and prevent them from continuing to occur, we recommend incorporating task management as an integral part of the process improvement. Using an online application for task management called *Asana*[3], we have created checklist templates for each BI event type that documents every task, which staff member should be assigned to each task, and the due date of each task. We propose that BI designate a staff member for each event who will be responsible for making sure the tasks are assigned to the appropriate staff member and have a target due date as guided by the template. The staff member responsible for the checklist will then be able to synchronize the tasks with the staff's Outlook calendars, thus providing quality control as the tasks can be tracked in both *Asana* and Outlook.

This application also has mobile capabilities which will allow BI staff members the option to access their checklist during the event on a smartphone rather than printing out a hardcopy. We have also provided updated checklist templates for each BI event type for the reengineered processes resulting from the process improvement rollout, as discussed in Section 6.1: Implementation of Recommendations. In addition, we customized a plan for BI and documented those instructions that demonstrate how BI can best use the application for their unique task management purposes.

BI currently uses a shared Outlook calendar to keep track of event dates. By utilizing the calendar synchronizing functionality provided by *Asana*, BI staff will be able to track their assigned tasks on their individual Outlook calendars. This will provide task reminders so that all the steps of the processes are completed and finished on time.

BI publishes an annual calendar as well as a monthly calendar. Sometimes, BI encounters issues where an event doesn't get confirmed in time to be included in the annual calendar, or an event has been published in the annual calendar and later needs to be changed or canceled. To facilitate creating a more accurate publication as the event date gets closer, while also providing sufficient planning time, we recommend that BI publish a quarterly calendar. The calendar for a particular quarter will be published during the middle of the previous quarter. For example, the quarterly calendar that has events for January through March will be published on November 15.

5.1.3 Backup Activities

Some events that BI coordinates have too many volunteers or insufficient supplies available, resulting in volunteers being unable to contribute. Given the importance of satisfying volunteers' desires to contribute to their communities, this is an issue that must be prevented. To address the possibility of the number of volunteers exceeding available supplies, we recommend that BI keep a set of backup activities that are always available. Examples can include writing letters to soldiers or making cards for the elderly. In order to execute this, BI should keep a box of supplies with the required items and take it to appropriate events (in terms of indoor/outdoor locations, etc.). This recommendation is most applicable to In-Office Events, but can also apply to community and Corporate Events.

[3] *Asana*: http://www.asana.com

5.1.4 Feedback

BI currently utilizes paper and *VerticalResponse* surveys to elicit feedback from volunteers (including Ambassadors) and non-profits. The response rates are very inconsistent due to volunteers leaving early, which makes them unavailable to fill out paper surveys, and limited emphasis on web-based surveys. To implement paper surveys, BI staff must stay later at events in an attempt to collect responses from the remaining volunteers, which results in wasted volunteer contribution time at the event and wasted BI staff time to manually input results into *Salesforce*.

To address these issues, we recommend that BI utilize entirely electronic surveys and create separate surveys for Ambassadors and volunteers. We also recommend that they integrate *VerticalResponse* survey results into the *Salesforce* database (as described in more detail in Section 5.2.2: *VerticalResponse*). To implement this, automatic e-mails should be generated after the event thanking the volunteers for their help, showing the impact of their work, and requesting that the participant fill out an online survey. BI should emphasize that feedback is important for developing future volunteer opportunities that maximize participants' impact. This revised will save time for BI staff members and volunteers at events.

5.2 Current Business Tools

This section provides recommendations regarding how BI can improve their use of *Salesforce* and *VerticalResponse*, which are their current business tools. We provide information about installing plug-ins that will integrate *Salesforce* to Outlook and *VerticalResponse* to *Salesforce*. We also provide information about automating some of their manual processes in *Salesforce*.

5.2.1 *Salesforce*

Salesforce is a Customer Relationship Manager (CRM) that BI uses to store all of their contact information and to measure impact. *Salesforce* has the ability to synchronize with Microsoft Outlook so that calendar and task updates to either application can be visible in the other. We recommend that this should be activated, which can be done through *Salesforce*'s settings and applied for each license in use[4].

Additionally, BI would like to simplify some of the steps that are involved with updating *Salesforce* for event participant information. Currently when a participant signs up for an event online, a BI staff member uses the automatically generated sign-up confirmation e-mail to manually enter the participant's information into *Salesforce*. This is a time-consuming task that can be prone to error and BI would like to have that process automated. Since *Salesforce* has been customized to meet BI's business needs, they will require a developer in order to automate those tasks. We recommend that BI find a *Salesforce* certified developer or a developer with *Salesforce* experience to implement this. An

[4] Salesforce-Outlook synchronization tutorial: https://na6.salesforce.com/setup/crmforoutlook/tutorial/SalesforceForOutlookVideo.htm

alternative is to find a developer who is willing to take on the challenge of determining how to make the appropriate modifications to the code that will automate the process. This will likely take significantly longer than it would for a *Salesforce* experienced developer as this developer will have to spend time examining the code and using Develop Force[5] and Technical Library as a resource to figure out what needs to be done before the coding, testing, and debugging phases can even begin.

5.2.2 *VerticalResponse*

BI currently uses *VerticalResponse* to create their monthly newsletter e-mails. Then they send those e-mails they created through Outlook since they have had bounce-back issues in the past when attempting to send them through *VerticalResponse*. Since *VerticalResponse* is a tool for e-mail marketing, among other things, BI would like to be able to both generate and send their monthly e-mails using *VerticalResponse*, thus simplifying the steps involved. BI chose this product since it has integration capabilities with *Salesforce*, but they have yet to explore that functionality. They also use *VerticalResponse* for creating surveys. We recommend that BI install *VerticalResponse for AppExchange*[6] to allow them to create and launch their monthly e-mails as well as access survey statistics. This application will need to be installed by their *Salesforce* Administrator.

VerticalResponse can have up to a 50% bounce-back rate for newly mailed lists. To mitigate that issue, BI can download their list of bounces, obtain updated e-mail addresses, and direct customers to the "opt-in" form where they can capture the new e-mail addresses.

5.3 Website Changes

Our recommendations for BI's technology changes with their website are covered in this section. We discuss general changes to appearance and information provided, automating the online sign-up process, and creating web portals for their customers to share information and automate event-matching.

5.3.1 General Re-design

We have some general suggestions for small changes that can be made to existing *Upcoming Events* and *Event Details* pages on BI's website. We also recommend adding an *Event Status* page to provide updates of event changes and cancelations.

[5] Developer Force: http://developer.force.com/
[6] VerticalResponse for AppExchange: http://help.verticalresponse.com/how-to/salesforce/

For the existing *Upcoming Events* page, BI should make the following changes:

1. BI should include BI contact information and include a link that says "Click here to volunteer" (to make it more clear where the user should go to sign up for the event)
2. BI should more clearly identify and separate the event time, date, location, and description to provide a visual improvement
3. A filter should be added that allows users to search events by geographic region
4. A month-by-month display of the events calendar should be added to provide a clearer overall view of events and simplify searching

For the existing *Event Details* page, BI should make the following changes:

1. Since volunteers sometimes attend events without the proper attire, BI should add information about the appropriate event attire (this reminder should also be included in reminder e-mails)
2. The sign-up form should be open by default on the this page, which would remove a barrier to signing up for potential volunteers and perhaps encourage more people to fill it out

We also recommend that BI develop an *Event Status* page. Having a status page on the website with the current status of upcoming events that lists information like the current number of volunteers, minimum need, capacity, date, and event status (no change, postponed, or canceled) would be informative for volunteers. An alternative to having a separate page for the current status of events would be to include a status on the *Event Details* page itself. Automatic e-mails should be generated for all participants whenever there is a change in the event status.

5.3.2 Online Sign-ups and Automation

We recommend that BI automate its sign-up process by directing event sign-ups to be completed online. After the online sign-up form is submitted, an automatic e-mail confirmation should be generated that also contains a link if the volunteer needs to cancel their registration. Providing the minimum number of sign-ups required will encourage volunteers to sign up for an event to prevent it from being canceled. Displaying a counter that starts counting down when there are five spots available is a good way to make volunteers aware that an event is about to reach capacity. Once an event has reached capacity, the sign-up form for that event should automatically deactivate. An automatic 48 hour advance notice reminder e-mail should be generated to remind volunteers of the event and to provide a BI phone number to cancel their registration – this will provide BI with a more accurate count of attendees prior to the event. If personal e-mail addresses are obtained during sign-up for In-Office and Corporate Events, auto-generated mailing lists could be used to inform employees of event changes.

5.3.3 Customer Portals

Many of BI's current procedures require a lot of back-and-forth communication with their NPPs and Program Partners. This is not only time-consuming for BI staff but also increases unpredictability in planning for events. We recommend that BI establish website portals for their Corporate and Non-Profit

Partners. They should have a website portal for their Ambassadors and building contacts as well as one for their NPPs. A login can be required for security measures and to keep proprietary information confidential. A "Remember password on this computer" option to bypass re-login could be a feature that BI's customers may find convenient. BI should use this site to post communication such as published calendars, flyers, event updates, post-event feedback reports, and any other information they want to share with their customers. Furthermore, e-mail notification can be generated and sent to appropriate parties for relevant updates. These portals can be especially useful for coordinating In-Office Events and Corporate Events. Details regarding their use related to those events will be discussed in the recommendations sections for In-Office Events and Corporate Events, Sections 5.4.4 and 5.4.5, respectively.

A feature that we recommend integrating into this structure is a criteria matching mechanism to match proposed Corporate Events to NPPs. This information is purely to explain how the code should function on the back-end to produce proper matching between companies and NPPs. There could be two types of questionnaires; one for the event and one for the NPPs. The event questionnaire should have several categories and options each with a checkbox so the companies can describe their requirements for a particular event. The NPP questionnaire should have categories and options each with a checkbox so that the NPP can identify what features their events have. For example, some of the attributes could be kid-friendly, location, number of volunteers, focus area, etc. As part of the initial account set-up, NPPs should fill out the questionnaire which will aid in determining what criteria should be used in event-matching for their organization. Every time a company requests an event, the event questionnaire should be filled out with the event requirements; that set of criteria will then be compared to each NPP to determine which NPPs are a good fit for the event requested. It is important that BI work closely with their developer before the criteria matching system is created to construct a comprehensive list of possible event requirements and NPP features so that an accurate and robust structure can be employed.

Since it is likely that there will be several instances where all chosen options will not match between the event and NPP, especially with a large set of selectable criteria, it would be beneficial to include pre-emptive strategies to avoid generating output that does not contain any matches. In the event questionnaire, there should be a field for rank next to each checkbox where a 1 to 5 ranking can be used to describe the level of importance for that particular requirement. Those weighted values would then be incorporated into the matching algorithm to produce optimal matching results. This is also helpful because the results would produce different levels of matching that would provide alternative options when criteria are loosened. The purpose of the event-matching is to streamline the Corporate Events process and the details will be discussed in Section 5.4.5 on Corporate Events.

Prior to pursuing this endeavor of developing web portals, it may be advantageous for BI to survey their NPPs and Program Partners to evaluate the value and utility of the portals from their customers' perspectives. Implementing these portals will not be a simple undertaking as they will take time and effort to design, code, test, and put into operation. Additionally, it will be very important to have thorough technical documentation that will serve as a future technical support resource. Although this

integration will require time and potentially monetary resources, the benefits that BI will gain through streamlined communication result in a significant improvement in staff efficiency.

5.4 Events

We have made recommendations that are specific to each event type. This section covers our recommendations for Donation Drives, Blood Drives, Community Events, In-Office Events, Corporate Events, and One-Off Donations.

5.4.1 Donation Drives

BI devotes many hours to the pick-up and delivery of donations for the Donation Drives that they coordinate. As part of that process they spend additional time pre-planning their trip sequence and mapping out their routes accordingly. We recommend that they use a route optimization software package to simplify the process. *OptiMap*[7] will allow BI to enter the addresses of their destinations in bulk, and it will then calculate the fastest path using Google Maps' algorithms. This tool will optimize the route by re-ordering the destinations to save travel time, while fixing the origin and final drop-off destination. This saves BI planning time as they no longer need to manually determine the order of the route they will take. *OptiMap* will also provide the directions from each destination to the next, saving BI from having to individually determine the routes. A screenshot of *OptiMap* is available in Appendix D: *OptiMap* Routing Tool.

Since Donation Drive pick-ups require most BI staff members, we suggest that BI utilize additional help for pick-ups and drop-offs of donations. They could recruit volunteer college interns who could also help them with other tasks as well, or they could recruit help from some of their Program Partner volunteers.

A frequently-encountered issue BI faces during Donation Drives is that sometimes Property Managers forget to put donation boxes out at the beginning of the drive, thereby losing valuable donation time. This can happen because the CC Team forgets to send out a reminder e-mail before the drive or because the Property Manager simply forgets even with the reminder. We recommend that instead of a reminder e-mail, the CC Team send the reminder as an Outlook calendar task request. This simple change will be a more effective reminder for both the Property Manager and the CC Team as a start and due date can be specified, it will show up on the Property Manager's calendar for those dates, the sender can keep a copy of the task on their own list, and the sender can request a status report when the task is complete.

[7] *OptiMap*: http://www.optimap.net/

5.4.2 Blood Drives

In order to streamline the online Blood Drive sign-up process, we recommend that BI make the following changes:

1. BI should add an appointment time selection requirement to the online sign-up form.
2. A contact preference field would let BI know whether the donor would like to be reminded about their appointment by phone or e-mail.
3. An automatic e-mail confirmation with a link to change or cancel the appointment should be sent after the form has been submitted.
4. As with all other online sign-ups, a 48 hour advance notice reminder e-mail should be sent to remind the donor of the appointment, provide donor preparation information (e.g., staying well-hydrated, possible drug interactions, etc.), and provide a BI phone number to cancel the appointment.
5. If the donor chose their contact preference as e-mail, they should receive that notification; however, if they chose their preference as phone, then BI will download a list of donor sign-ups so the event leader can call the donor to confirm the appointment.

5.4.3 Community Events

For events that can be considered dangerous, we advise that BI have each participant sign a liability waiver electronically when they sign up for the event. When an event is canceled, BI should send an automated e-mail that notifies volunteers of the cancelation and explains the reason why. When volunteers attempt to sign-up via e-mail they should be directed to the link that will allow them to sign-up online. If the event is already full BI should suggest another event during a similar timeframe or with a similar cause.

5.4.4 In-Office Events

BI can eliminate or reduce staff time spent at In-Office Events by recruiting assistance from Ambassadors and employees with the building hosting the event. This will provide greater flexibility to BI during event execution as their staff would be able to attend meetings they might otherwise miss or be able to use that additional time to devote to other important tasks. To ensure that during the event they are still conducting the same level of high quality that BI provides, a staff member can train the Ambassador and employee(s) that volunteer to help lead the event during the planning process. Documenting the instructions for leading the event will give the assistants something to refer to if necessary as well as be a training resource for similar future events. This can be piloted with an Ambassador that BI has worked with on many other occasions and has shown the ability to handle leading an event.

To prevent receiving projects that are completed incorrectly, we suggest BI print out a copy of instructions for each volunteer at the event. The volunteer will then be able to refer to the instructions,

and a sample completed project when available, while working on the project and avoid mistakes that could potentially make the project worthless to the NPP.

We recommend that the website portal be used to facilitate the sign-up process for In-Office Events. BI should send an e-mail containing a link for online sign-up to the building Ambassador who can then send the link to the employees. Allowing sign-ups to be processed through the website portal will create an automated and more uniform registration process for events.

5.4.5 Corporate Events

We recommend that when a company is interested in hosting an event, BI should require that they fill out an event request form that is located on the website portal for BI Program Partners. Once that form is submitted, it should post the event request on the website portal for the NPPs and generate an automatic e-mail notification confirming the request to BI and to the company that submitted the request. Another automatic e-mail should be sent to all the NPPs whose features match the posted event request. The NPP website portal should have a "We Are Interested" button next to the posted event request which would allow NPPs to respond with their interest. An automatic e-mail confirming the match should be sent to the interested NPP(s), the company that posted the event request, and BI.

BI should use the standardized response wait time to begin contacting NPPs if they do not receive event interest within a reasonable timeframe. They should begin by contacting the NPPs with the closest match from the criteria matching results. If they are unable to find an interested NPP after individual outreach, then they should contact the company who posted the event request to discuss a change of criteria or event.

5.4.6 One-Off Donations

For the One-Off Donation process, BI regularly receives short notice that requires a quick turn-around time for them to locate a non-profit that is not only interested in the donation but is also able to transport it. We recommend that they partner with an additional non-profit, Boston ReStore, or Furniture Trust, a non-profit that they have previously contacted. These companies collect office furniture donations and other supplies, and will be able to pick up and transport the large donations that BI doesn't have the office space to store. When requested to find a match for a large donation with a quick turn-around time, we suggest that BI make an initial attempt to find an organization within their network that is interested in the donation. If they are unable to find a non-profit that can use the item, then they can offer the donation to Boston ReStore or Furniture Trust.

BI sometimes is unable to track donations after they have been delivered or picked up. When the donation does not get entered into *Salesforce* they have no way of tracking what happened to it. This problem has a simple solution as it originates from a lack of enforced procedures. As soon as BI is contacted about the donation, the staff member who is contacted should create a donation record in *Salesforce*. Then, that same staff member should also be responsible for updating this record in

Salesforce after the donation has been picked up. Implementing those two steps as part of the One-Off Donation process will prevent any donation data from being missed.

6 Way Ahead

This chapter describes our ideas about the way ahead for Building Impact after this process improvement project is completed with GMU. First, we suggest that they implement the recommendations that they have been provided as a result of this project. Many of the recommendations involve technology changes and we have provided suggestions as to how they can implement them. After the changes have been implemented, if BI is interested in a follow-on project, we suggest that they team up with GMU for a subsequent modeling project of their improved processes.

6.1 Implementation of Recommendations

In order to provide an organized and efficient way of executing the various process improvement ideas, we are providing BI with a suggested Implementation Rollout Plan for our recommendations. The plan has been divided into two phases: Phase 1 contains the process improvements that can be implemented without outside technical support and Phase 2 contains the process improvements that will require the technical support expertise of specialized software developers. All the ideas have been decomposed to the task level and organized so that the ideas that are the easiest to incorporate can be implemented first. The plan also provides estimates as to how long the tasks will likely take. We created this for BI using a tool called *Smartsheet*[8] that offers a Gantt chart view. We exported this into MS Excel for their future use. This schedule will be valuable for the implementation as it has all the tasks subdivided so they can keep track of all the components and modify aspects as necessary.

The figure below is the Gantt chart for the online sign-up portion of the notional implementation of the process improvement rollout plan.

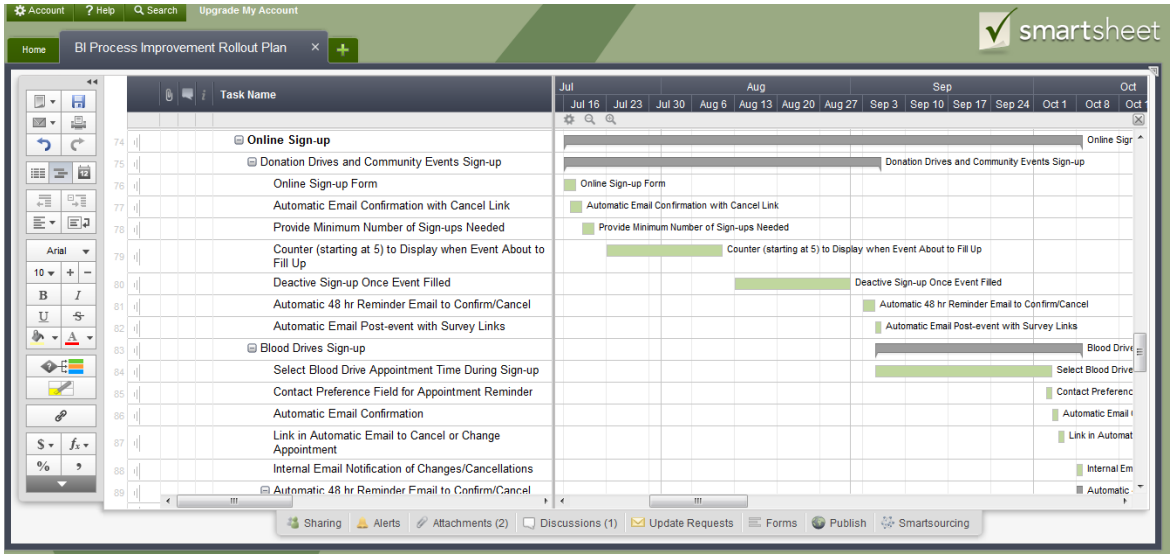

Figure 6: *Smartsheet* screenshot of online sign-up for BI Process Improvement Rollout Plan

[8] *Smartsheet*: http://www.smartsheet.com/

6.2 Technology Development

The first step after this project is completed is for BI to implement the set of recommendations. In order to implement the Phase 2 recommendations, BI will have to retain the services of a software developer, since they do not have that particular area of expertise within their current staff. One option to obtain these services is to have a volunteer with that expertise from Common Impact[9], an organization that matches skilled volunteers with non-profits, implement the technology related changes. BI has worked with Common Impact previously, so they have experience with their capabilities. Another option is to find someone who can help them on Catchafire[10], which is another volunteer service, or Elance[11], which offers low-cost overseas technological assistance. One more alternative is for BI to be a project sponsor for a web development project at Boston University or another university.

6.3 Future Project

In addition to our technology and process improvement recommendations, we encourage Building Impact to move towards becoming more data-driven. As the organization expands, it is critical to identify bottlenecks in its processes to make more efficient use of its resources. With appropriate quantitative data, systems engineering and operations research principles can be applied to formally identify these inefficiencies. We recommend that Building Impact work with a systems engineering or operations research group (possibly another George Mason University Master's capstone group, or a program closer to Boston) that can utilize simulation and modeling techniques to more quantitatively address their processes.

To fulfill this recommendation, BI must collect data that can be used by a future consulting group. In typical data analysis projects, a significant amount of preliminary effort goes into collection and aggregation of data in preparation for the actual analysis. We are in a unique position to prepare BI to collect data in an appropriate manner such that it will be of maximum use for a future project, as we know what data consulting groups would like to have available. The data BI should collect consists of the following:

1. Project information:
    a) When projects begin (through requests, idea formulation, etc.)
    b) What type of event (Donation Drive, Corporate Event, etc.)
    c) When projects end
2. How many hours each staff member spends on each project:
    a) Which BI staff member is involved
    b) Break the hours down into pre-event, execution of event, and post-event

[9] Common Impact: http://www.commonimpact.org/
[10] Catchafire: http://www.catchafire.org/
[11] Elance: https://www.elance.com/

c) Hours broken down further into specific, quantifiable tasks

Recording this information will allow a future consulting group to input the life-length of different types of projects, the order of resource requirements, and the consumption of resources into simulation software, such as Arena. Simulation software models can be based on the *Bizagi* models we developed, and the best-fitting distributions can be determined from the data collected (regarding arrival rates for different types of projects and service rates for different sub-processes).

A properly executed simulation study will be able to identify bottlenecks in BI's planning and execution of events and the optimal organization of resources. For example, a simulation would be able to determine if the two Community Connectors should work on the same projects or remain independent of each other. A simulation, possibly with a linear optimization model, would also be able to identify quantitatively at what point BI would need to hire additional staff to accommodate increased demand for projects.

We recommend that BI collect the appropriate data for at least six months, but ideally a year, to enable future consulting groups to have a comprehensive data set to work with. We have provided a spreadsheet for BI to record this information. It only includes tasks that are quantifiable in terms of time spent. We consider some tasks, like sending an e-mail or update the event website, to be minimal and not worth the effort of recording. At the end of each day or each week, BI staff should fill out approximately how many hours were spent on each task for each project. Our goal is to collect the most relevant information without overloading the already overburdened BI staff. See Section 9.4.5: Simulation Data Collection for these spreadsheets.

In addition to a future systems engineering and operations research project, we recommend that BI consider working with a Master of Business Administration project group to analyze their business model, customers, and future growth. This will help BI address their concerns about who they should consider to be their customers and what their true products and value are.

7 Conclusion

Building Impact provides an invaluable service to Boston and the surrounding areas by utilizing resources in buildings – donations and employees' desire to volunteer –to meet the needs of the local community. By formally modeling their processes for each of the six types of events and services they offer, we were able to identify inefficiencies. The process of going through each event's best-case scenario, sub-processes, and worst-case scenarios was helpful by itself – it helped BI better understand how they operate, step-by-step.

Since we are Systems Engineering and Operations Research students, we were in a unique position to assist BI with developing formalized process diagrams, analyzing their processes to identify inefficiencies, and preparing BI for a future project with a more quantitative analysis. We have laid the ground work and provided BI with the metrics that will be needed to prepare a future project group to perform a simulation study on BI's new and improved processes. This data-driven approach will allow bottlenecks and optimal resource allocations to be identified quantitatively.

BI has expressed great enthusiasm for implementing our recommendations, and we hope and expect these ideas to make a significant impact on their processes and efficiency. While any process improvement implementation can be a complex and daunting challenge, we believe BI has the energy and passion to follow through with these recommendations. These will not be simple changes, but we believe we have prepared them through our System Requirements Specification document, the *Asana* checklist templates, the *Smartsheet* process improvement implementation rollout plan, the *OptiMap* route optimization software, and the simulation data collection spreadsheets.

We are proud to have been able to work with Building Impact. We hope we have made a difference for them, and we hope they continue to make a difference for others.

All labor that uplifts humanity has dignity and importance and should be undertaken with painstaking excellence.

-Martin Luther King, Jr.

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9 Appendices

9.1 Appendix A: Glossary

Ambassador	Representative at the Corporate Partner who acts as the main point of contact for interfacing with Building Impact
Asana	Web-based checklist tool that enables the user to generate to-do lists with assignees and due dates for projects
BI	Building Impact
Corporate Partner	Same as Program Partner
CRM	Customer Relationship Management; a model for managing a company's interactions with customers
Customer	Refers to all stakeholders in BI's non-profit network and all Program Partners
Events	Refers to the six different types of events that BI supports (Donation Drives, blood drives, In-Office Events, Corporate Events, Community Events, and One-Off Donations)
Importance	Percentage ranking of the swing of an attribute based on previously determined rankings and range in scores
NPN	Non-Profit Network that includes all of the Non-Profit Partners that BI communicates with
NPP	Non-Profit Partner that is one of the nonprofits that is in BI's nonprofit network
OptiMap	Web-based optimization routing tool that can receive a list of locations as input and then output the most optimized route from this list
Program Partner	Partner to BI that are not in the Non-Profit Network or companies and organizations that supply volunteers and building space
Rank	Position of a category compared to all of other categories, where 1 is the best and 5 is the worst
Salesforce	Customer Relationship Manager that acts as a database used by BI to record information about all Program Partners and NPPs, create and record feedback for events, send e-mails through *Salesforce* integration with *VerticalResponse*, etc.
Score	Value of an attribute
SRS	System Requirement Specification; a document with a complete description of the behavior of a system to be developed
VerticalResponse	Online tool that can integrate with *Salesforce*; used by BI to create surveys for event feedback

9.2 Appendix B: Sponsor and Consultants

We would like to thank our sponsors at Building Impact for their assistance on this project. We could not have completed this project without their patience, understanding, and hard work. We would especially like to thank BI's Chief Executive Officer, **Charlotte Streat**; the Program Director, **Alison Spindler**; and the Communications & Operations Director, **Amanda Ferrante-Owen**.

Communication was frequent and consistent during the course of this project despite the added difficulties of distance. Building Impact is headquartered in Boston, MA, so throughout the course of this project we have been meeting with Building Impact on a near weekly basis via phone conference calls, Skype, and GoToMeeting. Countless e-mails have traveled between us discussing updates, project feedback, recommendation discussions, and other key topics. Once again, thank you to our sponsors for their hard work, cooperation, availability, and support during the entire semester.

We would also like to thank our professor, **Dr. Kathryn Laskey**, for her assistance and support throughout this project.

Our consulting team consisted of the following members:

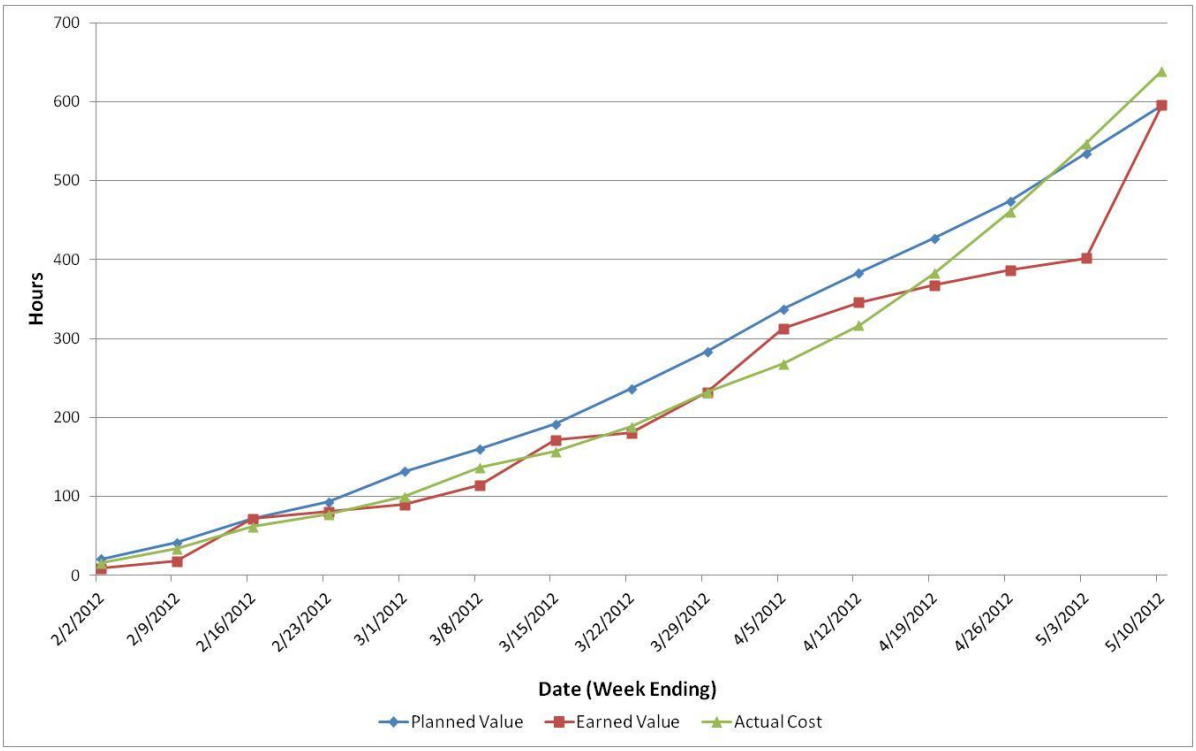
Fiona Ariaratnam: Fiona Ariaratnam has a Bachelor of Science degree in Applied Mathematics with a concentration in Operations Research. She has work experience in Operations Research and Finance. She expects to graduate from George Mason University in May 2012 with a Master of Science in Operations Research.

Mike Hockstein: Michael Hockstein graduated from The Pennsylvania State University in 2009 with a Bachelor of Science degree in Computer Science. He has been employed at the Lockheed Martin Corporation in the DC, Northern Virginia Area, as a Software Engineer during the past three years. Mr. Hockstein is expected to graduate from George Mason University in May 2012, with a Master of Science in Systems Engineering.

Mike Lovejoy: Mr. Lovejoy has a Bachelor of Science degree from the University of California, Berkeley in Industrial Engineering and Operations Research. For the last four years, he has worked as an Operations Research Analyst for the United States Government. Mr. Lovejoy expects to graduate from George Mason University in December 2012 with a Master of Science in Operations Research.

9.3 Appendix C: Earned Value Management

This is our Earned Value Management chart that documents our earned value over time. For each week we documented how many hours we planned to work on each task, how many hours we actually worked on each task, and how much value (in terms of hours) that we earned for each task completed in that week.



9.4 Appendix D: Deliverables

This appendix is used to show and briefly explain the products and tools we have suggested to BI throughout this report.

9.4.1 System Requirements Specification

We created an SRS and provided this document to Building Impact separately. See Section 4.3: SRS for more information.

9.4.2 *Smartsheet*

We provided BI with a notional Gantt chart that shows the order of implementation for the process improvement recommendations. This Gantt chart was developed in *Smartsheet* and exported to MS Excel.

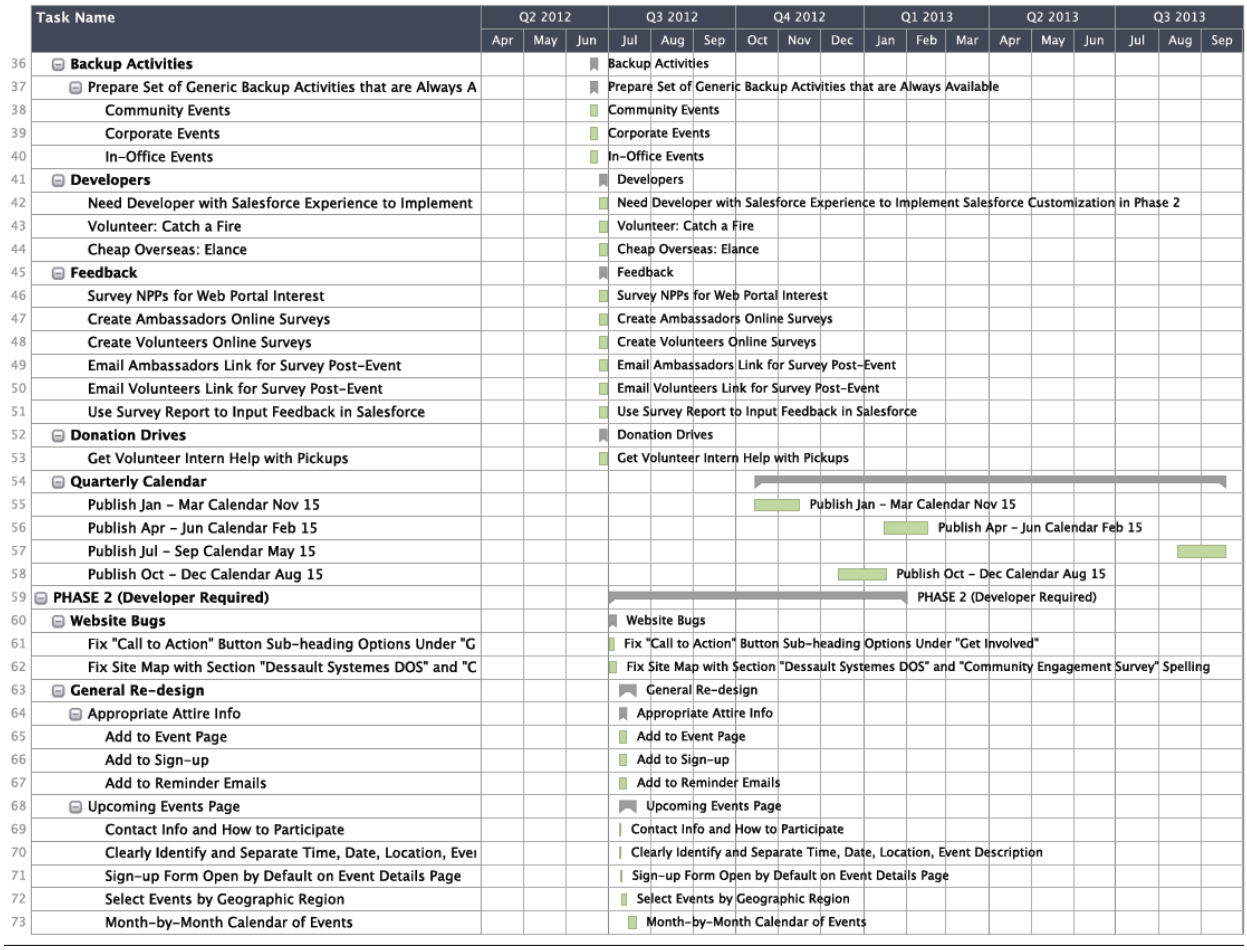
This is page 1 of 4 of the Gantt chart we provided to BI:

BI Process Improvement Rollout Plan

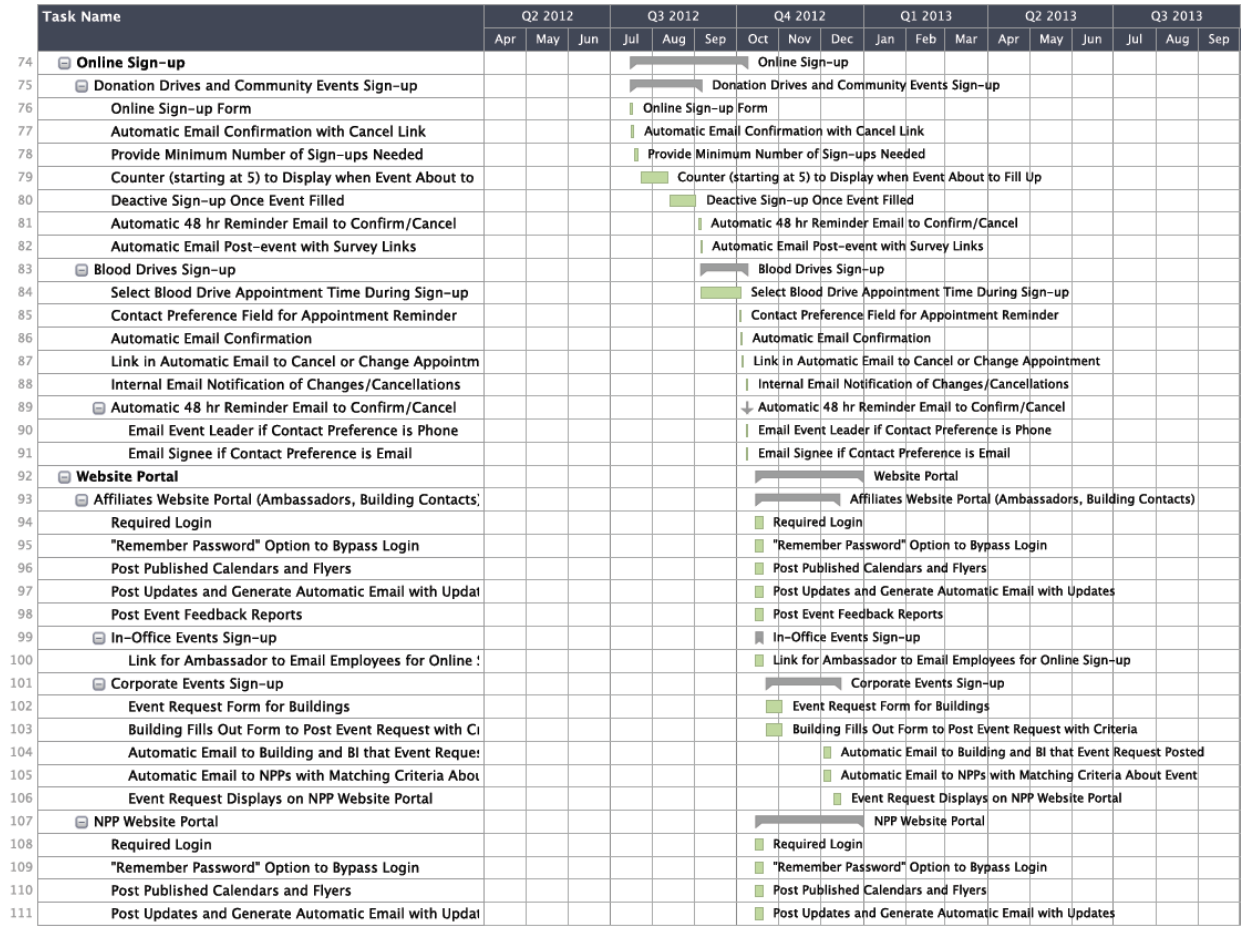
smartsheet

	Task Name	Q2 2012			Q3 2012			Q4 2012			Q1 2013			Q2 2013			Q3 2013		
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	**PHASE 1**																		
2	**Standardization**																		
3	Response Matching Wait Time																		
4	Communicate BI Can't Guarantee Match If Not Met																		
5	Response Feedback Wait Time																		
6	**Task Management**																		
7	Asana Checklist Templates																		
8	Prepare Current Procedures Checklist																		
9	Donation Drives Checklist																		
10	Blood Drives Checklist																		
11	Community Events Checklist																		
12	In-Office Events Checklist																		
13	Corporate Events Checklist																		
14	One-Off Donations Checklist																		
15	Assign Tasks and Due Dates																		
16	Sync Checklist for Outlook Reminders																		
17	Take Checklist to Event (Print or Smartphone)																		
18	**Salesforce**																		
19	Install Salesforce for Outlook																		
20	**Vertical Response**																		
21	Demo: Using Vertical Response for Salesforce																		
22	Install Vertical Response for Salesforce																		
23	Send Test Email																		
24	Create and Send Monthly Email																		
25	Watch Update Salesforce Statistics Video																		
26	Update Survey Statistics in Salesforce Through Vertical Re																		
27	**Donation Drives**																		
28	Use Route Optimization Software																		
29	Email Outlook Calendar Task to PM for Donation Boxes																		
30	**One-Off Donations**																		
31	Partner with Boston Restore/Furniture Trust for Pick-up																		
32	**In-Office Events**																		
33	Recruit Office Volunteer(s) for Help																		
34	Train Ambassador and Volunteer(s)																		
35	Provide Printouts of Step-By-Step Instructions																		

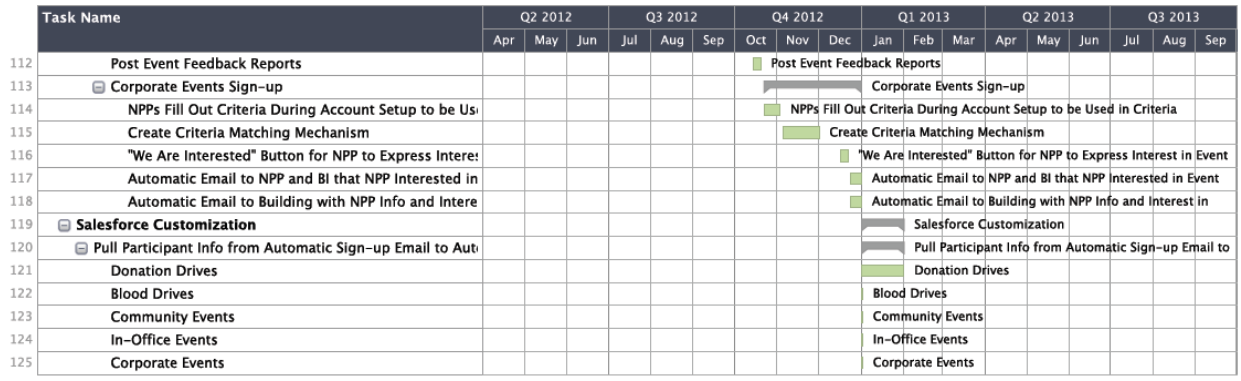
This is page 2 of 4 of the Gantt chart we provided to BI:



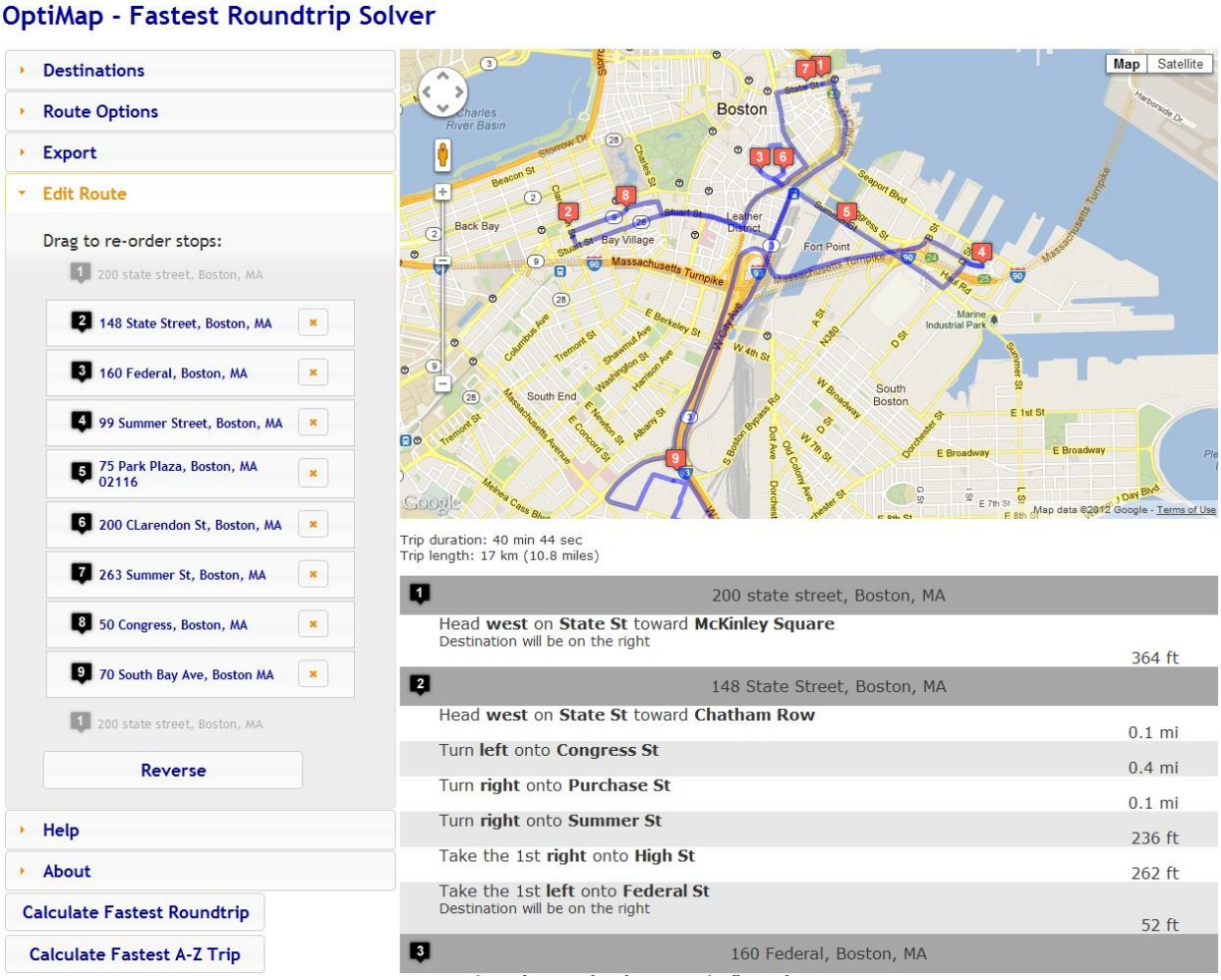
This is page 3 of 4 of the Gantt chart we provided to BI:



This is page 4 of 4 of the Gantt chart we provided to BI:



9.4.3 *OptiMap* Routing Tool



The image above shows the layout of the web-based map-routing tool *OptiMap*. It can find the optimal route to take for up to 15 destinations using Google Maps. It can still find a fast route when there are greater than 15 destinations, but it isn't guaranteed to be the most optimal route. This screenshot is taken of *OptiMap* after it has calculated the optimal route for a Food Drive event that BI ran in February earlier this year. All but the last location are the locations where boxes, filled with food, need to be picked up. The last location is the Food Bank drop-off location.

9.4.4 *Asana*

9.4.4.1 *Asana* Templates

The following figures are the templates we created for each event type in *Asana*.

[SENSITIVE INFORMATION REDACTED]

9.4.5 Simulation Data Collection

[SENSITIVE INFORMATION REDACTED]

9.5 Appendix E: BPMN Models

This section contains copies of our *Bizagi* models for all six types of events. We separated the events into pre-event, event, and post-event. Sub-processes are included for additional detail. We provided the actual *Bizagi* models to Building Impact separately.

9.5.1 Donation Drives

[SENSITIVE INFORMATION REDACTED]

9.5.2 Blood Drives

[SENSITIVE INFORMATION REDACTED]

9.5.3 Community Events

[SENSITIVE INFORMATION REDACTED]

9.5.4 In-Office Events

[SENSITIVE INFORMATION REDACTED]

9.5.5 Corporate Events

[SENSITIVE INFORMATION REDACTED]

9.5.6 One-Off Donations

[SENSITIVE INFORMATION REDACTED]

9.6 Appendix F: Scenarios

This appendix contains all documentation we received from BI without edits regarding best-case, sub-steps, and worst-case scenarios for all BI events.

9.6.1 Best-Case Scenarios

[SENSITIVE INFORMATION REDACTED]

9.6.2 Event Sub-Steps

[SENSITIVE INFORMATION REDACTED]

9.6.3 Worst-Case Scenarios

[SENSITIVE INFORMATION REDACTED]